CLINICAL DECISION-MAKING FOR CORONAL CARIES MANAGEMENT IN THE PERMANENT DENTITION

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Abstract

Key words: dental caries, caries susceptibility, dental sealants, chemotherapeutic agents, decision trees, tooth remineralization, fluoride varnishes, fluorides, chlorhexidine, decision analysis

Optimal conservative treatment decisions to prevent, arrest, and reverse tooth demineralization caused by caries require probability data on caries risk, patient compliance with prescribed chemotherapeutic, oral hygiene and dietary regimens, and treatment outcomes. This article is focused on the use of the best scientific evidence to recommend treatment strategies for management of coronal caries in permanent teeth as a function of caries risk. Evidence suggests that assigning therapeutic regimens to individuals according to their risk levels should yield a significantly greater probability of success and improved cost effectiveness than applying the identical treatments to all patients independent of risk. One of the obstacles to improvement of treatment outcomes is poor sensitivity of caries detection tests to identify all true lesions. This is especially true for studies in which only a mirror and explorer are used for visual examinations. Another is the lack of scientific studies that correlate individual risk levels with individual treatment outcomes. Nevertheless, population-based studies offer some evidence to support specific treatments as a function of risk. Depending on oral conditions and caries risk levels, treatment decisions can reduce the risk of unnecessary surgical intervention by incorporating the best evidence regarding the use of fluorine-releasing agents, sealant, chlorhexidine or combinations of these products.

INTRODUCTION

Because of the decline in the occurrence of caries over the last four or more decades and reduction in the rates of lesion progression, decisions on treating carious teeth through aggressive surgical options have recently been challenged. Emphasis has begun to shift from a philosophy of restoring most teeth with carious enamel lesions and all teeth with dentin lesions to one of restoring teeth only as a last resort when disease-arresting therapies have failed and cavitation has occurred or is very likely. Current devices and methods for identifying the presence or absence of carious lesions do not provide adequate levels of accuracy to avoid an unacceptably high percentage of misclassified carious lesions (1).

In spite of the limitations of our ability to accurately detect all carious lesions, we must use the best evidence to classify the caries risk of individual patients and offer the most beneficial treatment tailored to a given level of current risk and probable future risk. In addition, the severity of all detected lesions should be classified (no caries, E0; outer half of enamel, E1; inner half of enamel, E2; outer third of dentin, D1; middle third of dentin, D2; inner third of dentin, D3), and the caries activity status should be monitored over time to ensure that noncavitated tooth surfaces remain intact and are given sufficient time to remineralize to the fullest extent possible. To accomplish these difficult challenges, individual dentists must be able to reasonably assess the probabilities that (1) the lesions are correctly detected; (2) the surfaces are noncavitated; (3) disease-controlling therapies will be effective; and (4) outcomes provide more benefits than harm to the patient.

Several systematic reviews of the scientific literature (English text) between 1980 and 2000 were made to answer the following question: What are the best methods available for the primary prevention of coronal dental caries initiation in permanent teeth as a function of caries risk? A search on the subject of decision-making based on caries management in humans resulted in 1247 publications. By limiting the search to humans, English language, and the years from 1980 to 2000, the number was reduced to 973. By limiting the age range to subjects 13 years and older, the number of references decreased to 397. By eliminating root caries in the search, the number of relevant publications decreased further. Another search on chemotherapeutic agents for caries management produced 552 articles, which were reduced in number by excluding root caries. A third search, which was focused on sealants or combined treatments such as fluoride and sealant yielded 394 articles after root caries was excluded. Many articles were excluded if the method of detection of carious lesions was not identified or was not described in sufficient detail. Although the purpose of this article was not devoted to systematic reviews, this process provided clarification on the probabilities of potential treatment outcomes for individual agents and the combined use of agents.

Rohlin and Mileman (2000)(2) reported a systematic review of the literature on publications in dentistry of decision analyses during the past 30 years. They performed a systematic review of dental publications in the English literature on decision analyses during the past 30 years. A total of 67 articles were published, but only 22 of the articles presented a decision analysis with utilities and a sensitivity analysis. Four of the articles were related to caries or restorative decisions. The topics included methods for diagnosis of approximal caries (3), restorative decisions based on radiographic diagnosis of approximal caries (4), restorative decisions based on approximal carious lesions (5), and cost effectiveness of replacing amalgam restorations with crowns (6).

Mileman, Vissers, and Purdell-Lewis (1986)(3) analyzed three diagnostic strategies to determine the most appropriate treatment for an approximal lesion: (1) look and probe; (2)

bitewing radiography; and (3) look and probe together with bitewing radiography. Option 3 provided the optimal diagnostic pathway with the highest level of clinical information.

Tulloch, Antczak-Bouckoms, Berkey *et al.* (1988)(4) evaluated the optimal diagnostic threshold form bitewing radiographs that would maximize the benefits of restorative treatment. They obtained from 50 dentists estimates of possible outcomes associated with true and false positive and negative diagnoses. Of the three treatment options, (1) treatment of any radiographic change observed in enamel or dentin; (2) treatment only for surfaces where radiographic changes extended into dentin; and (3) treatment only if the radiolucency extends within 1 mm of the pulp, option 3 always optimized the expected value of restorative treatment. Option 2 would be the best treatment option for cases where the progression rate would be sufficiently rapid that 72% or more of advanced undetected lesions progressed to pulpal involvement before the next recall examination. Option 1 was not the preferred option for any of the assumed values.

Kay, Brickley, and McAndrew (1995)(5) analyzed the maximum expected utility of positive and negative restorative decisions based on bitewing radiographs. The treatment thresholds were: (1) no carious lesions; (2) caries confined to outer enamel; (3) caries within inner enamel; and (4) caries in dentin. The progression rates and failure rates of approximal restorations were based on values obtained from the scientific literature. Based on a three-year period, 110 non-dental professionals assigned utilities to treatment outcomes. Except for individuals at a high risk for caries, the decision "not to treat" was assigned the maximum utility value.

OPTIMIZING THE DECISION-MAKING PROCESS

The main objective of this review is to answer the following question: What are appropriate preventive treatment options for coronal caries in permanent teeth for patients at low-, moderate-, and high-risk for primary and secondary caries initiation and progression? One needs to know whether the lesion is slightly or well into enamel, or slightly or well into dentin, cavitated or noncavitated, arrested or remineralized.

To competently answer the question posed at the beginning of this section, the following additional information is required: (1) probability of lesion progression as a function of caries risk level; (2) probability of tooth surface cavitation over a specified period of time; (3) best treatment methods to arrest active lesions and potentially to remineralize teeth with noncavitated lesions as a function of patient risk level; and (4) lesion depth at which a restoration should be placed (threshold for surgical intervention) for a patient's initial risk level and that at subsequent recall exams

Benn and Meltzer (1996)(7) designed an analytical model to determine the influence of the threshold used for decisions on placement of initial restorations on the total numbers of restorations placed over a 10-year period. One group of patients (Group I) were assumed to have all lesions restored at baseline, but Group II patients would only receive restorations when the lesions extended into dentin. Group II treatment decisions were further analyzed relative to whether the lesions had slow progression rates (Group IIa) or fast progression rates (Group IIb). After 10 years Group IIa and IIb patients received 49% and 32% fewer restorations, respectively, than Group I patients.

PIT AND FISSURE SEALANTS

Selwitz, Nowjack-Raymer, Driscoll *et al*. (1995)(8) evaluated the combined use of sealants and fluoride over a 4-year period for prevention of caries in a group of 14-17-year-old children compared with the use of fluoride alone. Findings in 1987 for 134 children who received daily fluoride tablets and autopolymerizing sealants were compared with corresponding age-specific data derived from the 1983 examinations of children who received daily fluoride tablets (2.2 mg F). The group that received school-based fluoride and dental sealants experienced a 34.6% lower DMFS score (4.07) compared with that of the fluoride only group (6.22). This result indicates that pit and fissure sealant provides additional caries-preventive benefit compared with fluoride alone. However, only 71.8% of the sealants were completely retained over the 4-year period.

In a meta-analysis of sealant effectiveness, Llodra, Bravo, Delgado-Rodriguez *et al.* (1993)(9) reported data for 34 studies involving individuals between the ages of 5 to 14. Several of the data sets were obtained from follow-up of the initial subjects. Thus, 23 studies were included, only two of which included individuals 13 years and older. However, both of these studies were based on ultraviolet-light-cured resins and neither of these studies reported outcomes as a function of age. For the studies considered, the effectiveness of sealants increased for populations residing in fluoridated water communities (82.7%) compared with the lower effectiveness (72.3%) for populations associated with nonfluoridated communities.

Not included in the above review are the results of a 10-year study by Mertz-Fairhurst, Curtis, Ergle *et al.* (1998).(10) of bonded and sealed composite restorations placed directly over frank, cavitated lesions extending into dentin. This study involved 123 subjects with a median age of 23 years (ranging from 8 to 52 years). None of the sealed composite restored teeth (CS/C) received a cavity preparation except for a 45 to 60 degree occlusal bevel at least 1 mm wide that was placed on enamel prior to etching. This treatment was compared with two other treatment groups in which carious enamel and dentin was removed, but one tooth received an ultraconservative preparation, an amalgam filling, and sealant along the margin (AS), while the other received an extension-for-prevention preparation and an amalgam filling without a sealant (AU). Although this report lacks a clearly described protocol for detecting secondary carious lesions, standardized radiographs were used and validated to monitor lesion progression (if any). Thus, the experimental findings are relevant since the efficacy of sealing in carious lesions represents a much greater challenge relative to retentiveness and resistance to marginal leakage than that associated with traditional sealants placed over noncavitated tooth surfaces. Unfortunately, none of the outcome data were linked to subject age. These 10-year data are derived from a mixed population of children and adults and are reasonably representative of an adult population, although the study was based on the treatment of cavitated lesions. Nevertheless, the results provide additional evidence of the efficacy of sealants placed under the most adverse conditions. Over the 10-year-period, secondary caries occurred in only one CS/C case (1.2%), one AS site (2.3%) and seven AU sites (17.1%). Since the report did not list percentages, these values were computed by the present author as the worst-case scenario, i.e., assuming that these lesions were still present at the 10-year recall exam.

None of the radiolucencies progressed over the 10-year period. A quantitative computerized-assisted densitometric image analyses (CADIA) was performed on radiographs of four teeth of four patients that had been restored with sealed composite restorations without caries removal for periods of up to 10 years (11). No difference was found in the CADIA values between the area of carious and the noncarious controls at 6 months, and 2, 4, 6, and 10 years and it was concluded that the four sealed Class I composite restorations placed without caries removal remained "radiographically stable" over the 10-year period. The results of this study provide fair evidence that sealants placed only one time over small occlusal carious lesions, with no subsequent re-sealing treatment, can prevent progression of sealed caries.

Each of the selected studies was based on a one-time placement of sealant. Because of the significant loss of some or all sealant, resealing should be performed to further increase the efficacy of sealants. However, no evidence is available to support this hypothesis. Minimal evidence is available on the efficacy of sealants for adult patients. Few of the studies involved adult patients or evaluated the efficacy of sealants as a function of age. Thus, the evidence to support sealant use for adult patients is lacking and treatment regimens must be based on data derived from younger individuals. Nevertheless, the remarkable results from the Mertz-Fairhurst study provide fair initial evidence to support sealant use for pits and fissures in coronal areas of permanent teeth in adolescents as well as for questionable lesions and sites that reveal minimal evidence of caries activity.

CHEMOTHERAPEUTIC AGENTS FOR REDUCING NEW CARIOUS LESIONS IN HIGH-RISK SUBJECTS

Fluoride gels, rinses, and varnishes have demonstrated variable levels of efficacy in preventing caries or inhibiting the progression of carious lesions. The evidence for fluorine efficacy clearly indicates that no professionally applied fluorine-releasing product or restorative material has shown the ability to prevent caries in high-risk individuals. Similarly, chlorhexidine treatment alone has not been highly effective in preventing caries in the absence of fluoride. However, evidence does support, to a certain extent, the benefit of a combination treatment of chlorhexidine and fluoride. The remainder of this section will focus on the evidence to support this type preventive treatment.

Because of its powerful bactericidal potential against *S. mutans*, chlorhexidine has received considerable study regarding its caries prevention capability, especially for high-risk subjects (12-13, 30-44) However, limited data are available on the optimum strategy for treatment of individual patients. Thus, data obtained in private practices from combined chemotherapeutic and fluoride treatment will be required in addition to published clinical trial data to further develop our ability to optimally manage caries as an infectious disease.

A meta-analysis of clinical studies on the use of chlorhexidine for prevention of caries in 11- to 15-year-old children with *S. mutans* levels > 2.5 x 10^5/mL saliva (van Rijkom, Truin, van't Hof, 1996)(12) indicates that the caries-inhibiting effect of chlorhexidine is 46%. However, the results are quite variable as discussed below and are difficult to compare because of differences in methods for recording carious lesions, severity of carious lesions, baseline risk levels, concentrations of therapeutic agents, frequencies of application, and method of application.

Gisselsson, Birkhead,and Björn (1988)(13) reported that, after three years of professional flossing with 1% chlorhexidine gel applications to the teeth of 12-year-olds four times per year, the mean approximal caries increment was 2.5 compared with 4.3 for the control group ($p \leq 0.05$), which received a placebo gel without flossing over the same period. Thus, the frequency and professional flossing technique may have been responsible for the increased effectiveness compared with other studies described below.

Several studies reported no statistically significant difference in treatment efficacy of chlorhexidine when used alone or when combined with fluorine. Lundström and Krasse

(1987)(14) found no statistically significant difference in caries incidence between a group of 11-15-year-old orthodontic patients with *S. mutans* levels greater than 5 x 10^5 CFU/mL saliva who received during a 1.8-year period 1% chlorhexidine digluconate gel whenever their *S. mutans* concentrations exceeded this level. All children received oral hygiene and dietary instructions at three times, and fluoride mouthrinses twice a month and/or fluoride varnish annually. The failure to control the disease was explained on the basis of the inaccessibility of orthodontic appliances to chlorhexidine gel and possibly to the inability of chlorhexidine to reduce the increase in lactobacilli during orthodontic treatment.

Petersson *et al.* (1998)(15) treated 115 12-yr old children semi- annually with a mixture (1:1) of a varnish containing 0.1% F (Fluor Protector) and 1.0% chlorhexidine (Cervitec). A control group of 104 children received fluoride varnish treatment (Fluor Protector) semi-annually. Approximal caries was recorded from bitewing radiographs at baseline and after 3 yr. At baseline, total decayed and filled surfaces (DFS) including enamel caries were 1.79 ± 2.36 in the control group and 2.0 ± 2.77 in the test group. After 3 yr, the mean approximal caries incidence values were 3.01 ± 3.74 and 3.78 ± 4.32, respectively. The differences at baseline as well as after 3 yr were not statistically significant. The results showed that both groups had a comparatively low incidence of approximal caries during the experimental period, and suggest that a mixture of fluoride and antibacterial varnish had no additional preventive effect on approximal caries incidence compared with fluoride varnish treatments alone. More frequent applications of fluoride varnish and chlorhexidine were suggested and possibly a fluoride concentration greater than 0.05% in the combined varnish mixture.

Fennis-Ie, Verdonschot, Burgersdijk *et al.* (1998)(16) found no significant occlusal caries reduction ($p > 0.05$) in newly erupted permanent molars of 11/12-year-old children followed over three years after twice-per-year applications of either 40 wt% chlorhexidine diacetate varnish or a placebo varnish. All children received fluoride varnish twice per year. However, a significant difference was found when the children were stratified according to low-risk (0.6 dentin caries lesions/permanent molar/child) and high-risk categories ($\geq 10^6$ CFU/mL saliva; 1.4 dentin caries lesions/permanent molar/child). The risk level of these children was low overall with a mean DMFS score of 1.0. Spets-Happonen, Luoma, Kentala *et al*. (1991)(17) studied a higher risk group (DMFS from 5.0 to 6.6) and also found no statistically significant differences after 33 months in DMFS increments among a control group (3.8 ± 5.7), a 0.05% chlorhexidine plus 0.04% NaF group (2.5 ± 3.7) applied twice per day every third week, and a 0.05% chlorhexidine only group (3.4 ± 5.5).

In sharp contrast, Zickert *et al*. (1982)(18) reported a statistically significant difference between the mean caries increment over three years (DS = 4.2) of a test group of 13-14-year-old children with $\geq 2.5 \times 10^5$ *S. mutans*/mL saliva that received oral hygiene and dietary instructions and an application of 1% chlorhexidine gluconate gel for 5 min after tooth cleaning for 14 days compared with the control group (DS = 9.6). Children in the control group with $\geq 2.5 \times 10^5$ *S. mutans*/mL saliva did not receive either chlorhexidine or a placebo gel. All children rinsed during school terms throughout the study once every two weeks with 0.2% NaF solution. When the level of *S. mutans* in the test group was reduced to $< 2.5 \times 10^5$ CFU/mL, all unfilled premolar and molar occlusal surfaces were sealed at the beginning of the study to minimize the risk of re-infection. Most of the caries activity was associated with new lesions on approximal and buccolingual surfaces. For the highest-risk children, i.e., those with $\geq 10^6$ CFU/mL initially, the mean DS increment after three years was 3.9 for the test group and 20.8 for the control group.

Although not included in the initial search because it was published before 1980, Luoma, Murtomaa, Nuuja *et al.* (1978)(19) reported that caries management therapies in extremely high-risk children (DMFS scores from 27.4 to 31.4) 11-15 years of age, revealed significant differences in mean DMFS increment among groups receiving a 2-min daily rinse in school (200 days per year) and three times per day of daily toothbrushing during weekends of one of the following: (1) no treatment control group (ΔDMFS = 6.30); (2) placebo solution (ΔDMFS = 5.08); (3) 0.044% NaF (ΔDMFS = 4.31); and (4) 0.05% chlorhexidine gluconate plus 0.044% NaF (ΔDMFS = 2.9);. The mean differences were significant between Group 4 and the control group ($p \leq 0.001$) and the placebo group ($p \leq 0.05$) as well as between Group 3 and the control group. These latter two studies provide fair supporting evidence for the use of high frequency and low doses of fluoride and chlorhexidine solutions for very high-risk patients.

Fair evidence exists to establish a link between the efficacy of chlorhexidine gel and a reduction in caries increment. The study of Gisselsson, Birkhead,and Björn (1988)(13) mentioned above and that of Axelsson, Buischi, Barbosa *et al*. (1994)(20) suggest that periodic professional flossing four times per year with a 1% chlorhexidine gel may be more effective in reducing approximal lesions than mouthrinsing with chlorhexidine solution. Further studies are needed to confirm the results of these two studies and the relative caries risk level above which this therapy is effective.

All of the subjects in the studies cited above were between the ages of 11 and 15 years. The present author has found no randomized, controlled clinical trial studies of adult subjects that are at least two years in duration. Three relevant articles were found for adult subjects, but these were associated with irradiated subjects. However, none of these met the acceptance criterion of at least two years duration. One study also lacked a control group,(21), one was related to root caries,(22) and one was only 6-10 mo in duration and did not differentiate coronal from root lesions.(23) Thus, it is not possible to make evidence-based recommendations on management of caries in a high-risk adult population. In the meantime, one might assume that the regimens reported above for adolescents could be used as an interim measure.

A systematic search of the literature has found no randomized, controlled clinical trial studies of chlorhexidine efficacy for control of caries in adult subjects that are at least two years in duration. Three relevant articles were found for adult subjects, but these were associated with irradiated subjects.

THRESHOLD FOR SURGICAL INTERVENTION

The decision-making principles described previously require the use of key data from the scientific literature to address the questions raised earlier regarding the management of coronal caries in the permanent dentition. Based on 397 articles found in the systematic search for decision-making evidence to support treatment for high-, moderate-, and low-risk for caries, a synthesis of this information will provide a preferred course of action that should yield the best outcome assuming that the carious lesions, lesion severity, caries activity, and risk factors have been accurately classified. The questions raised earlier on the best treatment options based on an individual's caries risk and predicted future caries risk will now be addressed.

We can justify a delay in restorative treatment of enamel lesions in the inner half of enamel and even slightly into dentin on the basis that caries progression in moderate-risk and high-risk patients through enamel is slow (24). Caries progression has been decreasing over recent decades (25) and is slower in patients who have received regular fluoride treatment or who consume fluoridated water (26). Progression times through enamel may take from 6 to 8 years (27-31). Since many enamel lesions remain unchanged or progress very slowly over long periods and because progression rates through dentin may also be comparably slow (32), there is adequate time to apply infection control and monitoring procedures to assess caries risk and lesion activity status over extended periods of time. Furthermore, the percentage of radiographically visible approximal lesions in the outer half of dentin that are cavitated has declined over the past several decades to approximately 41%.(33)

To minimize variability in decision-making and to optimize cost effectiveness and the cost-benefit parameters of care, the strongest evidence on treatment regimens must be used. Summarized in Table 1 is a comparative assessment of the strength of evidence of various treatment options for caries management in coronal areas of permanent teeth for adolescent and adult patients. As can be clearly seen, the strength and quality of data supporting management options for adult patients are generally poor.

For teeth with cavitated surfaces, a restoration should be placed after initial efforts to reduce caries risk have been taken. Summarized in table 2 is a summary of treatment options as a function of caries risk. As shown in Table 2, all tooth surfaces with cavitated lesions should be restored since they cannot be reliably remineralized and maintained free of plaque. For teeth with approximal lesions, the surface integrity cannot readily be determined unless the teeth are separated or the lesion severity is sufficiently great (middle third of dentin, D2, or inner third of dentin, D3, that the probability of cavitation is very high (33). The results of these studies indicate that approximately 60% of approximal tooth surfaces with radiolucencies extending into the outer half of dentin are not cavitated (33). However, these results do not agree well with those of Akpata, Farid, al-Saif, *et al.* (34) who reported that only 20.9% of the surfaces were not cavitated when the lesions were found in the outer half of dentin.

Foster (35) investigated the proportion of approximal carious lesions extending up to 1 mm into dentine that progressed over a 3-year period. After 36 months, lesions that extended over 0.5 mm and up to 1 mm into the dentine were significantly more likely to have progressed (92%) compared with shallower lesions that extended up to only 0.5 mm into dentine (50%). These results suggest that operative intervention be considered for approximal lesions that extend deeper than 0.5 mm into the dentine, while preventive treatment and re-assessment may be considered for shallower lesions.

Professional flossing with chlorhexidine gel should be performed at least four times per year to ensure adequate reduction of *S. mutans* levels. Since chlorhexidine is not effective against lactobacilli, plaque removal and diet modification may reduce the level of lactobacilli and the probability for lesion progression. In addition fluoride therapy should be closely linked to the use of chlorhexidine use for high-risk patients. Little additional benefit is likely to be realized by treating moderate-risk or low-risk patients with chlorhexidine although fluoride therapy is still advised for moderate-risk patients until they are clearly shifted to a low-risk level.

Clearly, monitoring for positive and negative changes in the activity status of the disease is the most important aspect of caries management. If the caries process is active, early interventions to arrest the process will reduce the probability of cavitation and potential restorations. Monitoring at intervals determined by risk will also ensure that the prescribed treatment benefits will be sustained and that low-risk patients will not be over-treated. Since the strength and quality of evidence for most treatment options is relatively poor overall (Table 1), doses and frequencies of therapeutic agents must be adjusted periodically depending on whether the targeted outcomes are achieved or not.

Table 1. Strength and quality of evidence on efficacy of caries management treatment options for high-risk patients (0 = none, 1 = minimal, 2 = fair; 3 = good)

Treatment Option	Adolescents	Adults
Fluoride toothpaste	2	2
Fluoride tablets, mouthrinses, or combined fluoride sources	2	2
Fluoride varnish only	2	0
Sealant only	2	1
Chlorhexidine only	1	1
Chlorhexidine plus fluoride	1	1
Sealant plus chlorhexidine	0	0
Sealant plus fluoride	0	0
Sealant plus chlorhexidine and fluoride	0	0

Table 2. Treatment options based on caries risk, lesion severity, and surface integrity

	Low Risk	**Moderate Risk**	**High Risk**	**High Risk**
Lesion Severity	E1, E2, D1	E2, D1	D1, D2, D3	D1, D2, D3
Surface Integrity	Noncavitated	Questionable	Cavitated	Cavitated
Caries Activity	Inactive	Questionable	Active, progressing slowly	Active, progressing rapidly
Treatment Option	Diet and oral hygiene control; monitor for new lesions at 6-to12-mo recall periods	Diet and oral hygiene control; professional and home flossing with 1% CHX; periodic F; monitor at 6-mo recall periods until shifted to low risk (or < 2.5 x10^5CFU/mL)	Diet and oral hygiene control;, professional and home flossing with 1% CHX; seal pits and fissures; restore cavitated surfaces; daily F; monitor at 3- to 6-mo recall periods until shifted to low risk (< 2.5 x 10^5 CFU *S. mutans*/mL)	Diet and oral hygiene control; professional and home flossing with 1% CHX; seal pits and fissures; restore cavitated surfaces, daily F; monitor at 1- to 3-mo recall periods until risk is reduced (< 2.5 x 10^5 CFU *S. mutans*/mL)

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